THE EFFECTS OF TOURISM ON CONSERVATION AT THE MONKEY FOREST IN UBUD, BALI

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ABSTRACT

The common long-tailed or crab-eating macaque has had a long history of commensalism with humans. For thousands of years this species, *Macaca fascicularis,* has benefited from its association with humans. Over the past decade, however, populations of this species of monkey are declining with the continually increasing economic activities of humans in Southeast Asia.

Economic activities, such as logging or agriculture and other forms of habitat destruction along with human population growth are often responsible for the worldwide decline in the populations of non-human primates. This article reports on a notable exception to this decline by documenting an increase in population size of this species of monkey at one monkey forest in Bali, Indonesia. By promoting traditional Hindu religious values and tourism at The Monkey Forest of Ubud, the local community is effectively protecting all its flora and fauna. The local people have also formed The Monkey Forest Managerial Committee which works within their traditional religious/customary unit. This Committee has proposed and enacted numerous conservation measures including erosion control, replanting trees and increasing the size of the forest. We have worked closely with the local people for over seven years now and we emphasize the importance of working within the traditional forms of local government. We have given the preliminary results of our research to the Committee and offered our advice on some of the problems that arise, for example, between monkeys and tourists. Scientists can play an effective role in conservation by working closely with the local people within their cultural context.

Key words : Indonesia, conservation, tourism, Hindu, Balinese monkey forest, *Macaca fascicularis.*

INTRODUCTION

Nonhuman primate populations are declining in many areas throughout the world. Although each country varies with regard to the circumstances responsible

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for the loss of primates, the most important factor of declining primate populations is habitat destruction which is tied to economic activity and population growth (Mittermeier and Cheney, 1986). If this is true, then it should be possible, through increased economic activity, to also conserve habitats and primate populations. Some efforts have been made along this line. Organizations and governments have donated money, experts have been consulted, and surveys have been conducted. As most cultural anthropologists know, however, if anything is to succeed, then all facets of the problem must be understood and, most importantly, the support of local people must be realized.

This article reports on the origin of conservation efforts in the village of Padangtegal, Ubud, on the island of Bali, Indonesia. Increasing economic development through tourism in Ubud is responsible for the most systematic local conservation efforts in Bali. As such, it represents new hope and a valuable model for future conservation efforts.

One of the most important countries for primate conservation is Indonesia, especially because it has the greatest primate diversity in Asia (Mittermeier and Cheney, 1986). Although most conservation efforts have been justifiably concerned with endangered species, there is reason to be alarmed over the increasing disappearance of the long-tailed macaque (*Macaca fascicularis*). This species is not considered to be « threatened », however, it is commonly perceived to be an agricultural pest, and we have seen these animals hunted in some areas of Bali. On some Philippine islands, the species is rare or extinct because of habitat destruction and trapping (Marsh, 1987). The species accounted for 56 % of the total number of all primates imported worldwide in 1978 and 1979 (Mack, 1983). McNeely *et al.* (1990) have estimated a 68 % loss of range for *M. fascicularis* in Southeast Asia, and Brautigam (1991) has called for further clarification or investigation of its range. The rapid population decline of *M. fascicularis* is similar to the serious population decline of the rhesus monkey (*Macaca mulatta*), another once very widespread and common Asian monkey. Unless steps are taken now to develop conservation measures, the joy of watching primates will be denied to future generations.

All Indonesians know about the monkey god, general *Hanuman* from the ancient Indian epic poems, the *Mahabharata* and the *Ramayana.* Hinduism has had a strong influence on Indonesia for over a thousand years. The *Mahabharata* and the *Ramayana* are said to have entered Java around the fourth century A.D. Javanese poets translated these epics into ancient Javanese in the ninth century (Hurip, 1990). The social values of these epics have permeated every aspect of life throughout Indonesia, especially in Bali. While Indonesia is over 90 % Moslem, the island of Bali is over 93 % Hindu (Eiseman, 1989). Once a week, *Hanuman* and various other monkeys can be seen in the many dances in Ubud, such as the *Kecak,* the *Ramayana,* and the *Calonarang.* In these dances *Hanuman* aids the epic heroes fight demons. A more fundamental Balinese Hindu belief relating to conservation is the principle of harmony and balance, *tri hita karana,* which involves the three forces of people, the universe, and God. The proper balance or center of these forces is essential for health and prosperity (Jensen & Suryani, 1992).

METHODS

Research on *M. fascicularis* was conducted June through August or September of 1986, 1990, 1991, and 1992 in the Monkey Forest in the village of Ubud,

Bali. The age-sex composition of all monkeys in the forest was noted and all adult individuals were named. Infants were carefully monitored at birth to better understand their manner of death. Inter-troop encounters were noted whenever the aggressors supplanted the losers' space.

Methods more typical of cultural anthropologists were also employed. Census figures for the village were obtained from the office of the village head. Discussions were held with local villagers, especially the members of The Monkey Forest Managerial Committee of Padangtegal. This Committee was established in 1991 and its members prepared a statement or program of its goals and activities. Copies of these programs for the years 1991-1993 were obtained and translated. A total of 136 questionnaires were distributed and collected in 1992 by a young, local Balinese male university graduate. Among the questions asked were the following : 1) Does a large part of your income depend on tourists ? 2) How many times do you visit the monkey forest each week ? 3) Is The Monkey Forest an important part of Balinese culture ? 4) Has your income increased because of The Monkey Forest ? 5) Are the monkeys more aggressive now than five years ago ? 6) Are there too many monkeys ? 7) Do you think shops and hotels should contribute to the conservation of The Monkey Forest ? 8) Should the Monkey Forest be advertised to bring in more tourists ?

Fifty tourists also were interviewed in English, German or Indonesian as they left The Monkey Forest. Questionnaires were filled out by the interviewer. Among the questions asked were : 1) Did you come to see the monkeys ? 2) Are you afraid of monkeys ? 3) Did you feed the monkeys ? 4) Did the monkeys bite you ? 5) Would you recommend a visit here to another tourist ? 6) What suggestions do you have to improve The Monkey Forest ? 7) What country are you from ?

RESULTS

The Monkey Forest

The Monkey Forest is located just south of the main road through the village of Ubud. Ubud is about 20 km north of Denpasar, the provincial capital of the island of Bali. The Monkey Forest is about four hectares in area and it contains three temples and a graveyard. The main temple is the *Pura Dalem* or Death Temple. There is also a Cremation Temple and a Bathing Temple. Several years ago irrigated rice fields almost totally surrounded the Monkey Forest. Recently, however, shops and hotels are being built along its northern and southern borders.

The local villagers who work and live near The Monkey Forest consistently report that the total population of monkeys in 1968 was 23 ± 1. At about the onset of provisioning in 1976 the population was said to be 25. In 1978, Koyama *et al.* (1981) reported 31 animals. The results of subsequent surveys of three troops and all peripheral males are reported in Table I.

Table I shows a rapidly increasing population up to 1991. There was a 123 % increase in the eight years between 1978 and 1986 ; a 61 % increase in the four years between 1986 and 1990 ; a 17 % increase between 1990 and 1991 and no increase the next year. The adult sex ratio dropped from 6.75 adult females/adult male in 1986 to 2.8 in 1990 and 1.9 in 1991. Between 1991 and 1992, however,

TABLE I

Census data for The Monkey Forest.

Year	Adult Males	Adult Females	Infants[a]	Juveniles[b]	Total	% Immature[c]	% Natality[d]
1986	4	27	16	22	69	.55	.59
1990	11	31	10	59	111	.62	.32
1991	21	39	16	54	130	.54	.41
1992	22	46	15	47	130	.39	.33

[a] Infants are animals who are still nursing. They are usually less than one year of age.
[b] Juveniles are animals who have been weaned and either have not given birth in the case for females or who do not have their permanent canines as is the case for males.
[c] Immatures refer to both infants and juveniles.
[d] Natality refers to live births/adult female.

the ratio rose up to 2.1. Adult males made up between 10-17 % of the population during the four years of study. Adult females ranged between 28-39 % of the population ; juveniles ranged between 32-53 % and infants ranged between 9-23 % of the population in each of the four years of study. In Table I the 39 % of immatures and the 33 % natality in the 1992 population are rather low (see discussion). The percent of both infants and juveniles (immatures) and the percent of live births/adult females (natality) are important indicators of population parameters in the future.

There have been 14 infant deaths during the four years of our study. Seven infants probably died of starvation, when the mother or female kidnappers did not lactate (see Fig. 1). Three infants died of wounds and perhaps two others also, because their mothers had wounds ; two infants died in an unknown manner. We have not seen any animal kill another.

In 1986 there were 22 cases of aggressive inter-troop encounters. This is a rate of 1/15.5 hours of observation. In 1991, I saw 20 cases for a rate of 1/6.15 hours of observation.

The Village of Ubud and The Monkey Forest Management

The village of Ubud is located in the district of Gianyar and the sub-district of Ubud. Census figures indicate that as of March 31, 1990 the village of Ubud had 8,150 people. This is an increase of 313 people from the census of 1988, which indicated a total of 7,837 people. These census figures do not indicate the number of temporary residents, which may be considerable. Such residents may live there part of the year and others may commute to Ubud to sell goods to tourists. Between 1986 and 1990 an additional area or *lingkungan* was added to the village. In 1986, there were only a few hotels and shops within one kilometer of the forest. By 1991, all the roads were paved and there were dozens of hotels and several hundred shops.

The Monkey Forest does not really « belong » to the village of Ubud. It belongs to the *Pura dalem* of the nearby area called Padangtegal. The *Pura dalem*

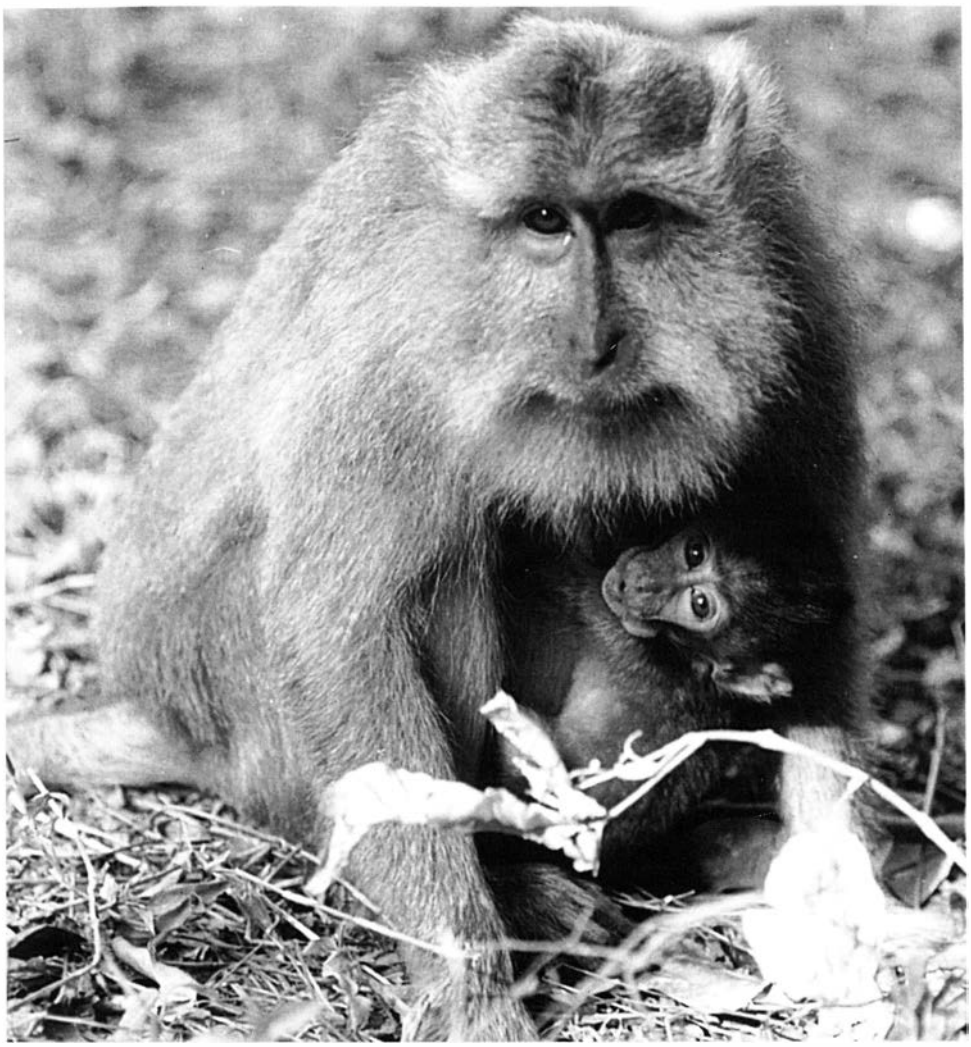

Figure 1. — An adult female and infant *Macaca fascicularis* in The Monkey Forest at Ubud. This is the alpha female of the most dominant troop in 1991 with an infant from another troop. Photo by B. Wheatley.

is the village temple dedicated to *Siwa,* the dissolver, or his wife *Durga.* The *Pura dalem* is often called the Temple of the Dead. The Monkey Forest is run by the members of Padangtegal's *desa adat* or religious/customary unit. The members of this unit worship at the various Hindu temples, including the *Pura dalem* located in The Monkey Forest.

In 1991, the members of Padangtegal's *desa adat* founded The Monkey Forest Managerial Committee. This Committee drafted a new Program of

Management for The Monkey Forest. The previous managerial body was inefficient and the aim of the new committee was to better manage and conserve The Monkey Forest for the benefit of the community. A detailed conservation plan was proposed by the committee. They proposed to change the feeding areas for monkeys in order to avoid the deterioration of the forest and to provide water for the monkeys. They proposed to stop erosion by building terraces and planting 5 000 seedlings, preferably endangered species that could also be used for ceremonial purposes. They also hoped to save the jungle fowl and iguana. They proposed to hire workers to clean the area, to provide trash cans, and to put up signs telling tourists not to disturb the animals. They proposed to add a hectare of land to increase the size of the forest. The Committee also proposed to provide better administration of the facilities. Especially important was the proper recording of the number of visitors and the income generated each day. Better security was also proposed. The number of guard posts was to be increased, and maps, toilets, and lights were to be constructed or installed. New parking lots were proposed and unauthorized vehicles were not allowed to enter the forest.

The 1991 Program also included the new name of The Monkey Forest. The previous name was *Alas* or *Ciung Pemaosan* and it was now called *Wenara Wana.* This latter name is in Sanscrit, a sacred language, and reflects the sacredness of *Hanuman,* the monkey god. Stories of the sacredness of these monkeys were told by the old men of the village. One of these stories involved the attempt by the people in the 1930's to chase monkeys out of the forest so that the coconuts and other foods could be harvested. For several months there were no monkeys, but gradually more and more monkeys reappeared in the forest. The moral is that God wanted these monkeys there and the monkeys belong to God. Another story involving *Hanuman* was told by a fifth generation village priest. When he was a boy, he had a vision of *Hanuman. Hanuman* is the symbol for the priest's energy, his *Betara Bayu,* one of his four siblings. The vision was an omen to serve God as a priest. This priest has a special duty to give offerings to *Hanuman* at The Monkey Forest on full and new moons so that the monkeys will not be dangerous to people.

The 1992 Program issued by the Committee states how important tourism is for the *desa adat* and that the management principle follows *tri hita karana.* The goals of the Committee are to preserve and strengthen *desa adat,* to promote, conserve, and improve The Monkey Forest and to increase income and provide jobs for the members of Padantegal's *desa adat.* The proposed activities for 1992-1993 are basically the same as 1991. The Committee specifically stated its concern for the rapidly increasing population of monkeys. Most of the 1991 proposals were enacted.

In 1991 we submitted to the Committee our preliminary research conclusions, as well as guidelines for tourist safety and a map of the forest. By 1992 our tourist guidelines and map were placed on large signs at the entrance to the forest and in the forest. These signs, for example, warn tourists not to let monkeys touch them and to feed monkeys from a safe distance. Tourists are warned not to grab a monkey and if one climbs on them, tourists are advised to drop their food and walk away until it jumps off. A number of other changes were noticeable. Food for the monkeys was only sold at the entrances, with one exception. The daughter of the priest of the *Pura dalem* and wife of the village priest was allowed to sell food next to the *Pura dalem.* Water was supplied to the monkeys in a small « bathing » pool. Stone terraces were built for erosion control and trees were planted. The monkeys

destroyed most of the newly planted trees. The trees to survive the best were *gamal, Gliricidia sepium,* whose leaves can be fed to cattle. These trees were grown in a grassy area in an attempt to increase the size of the forest. Workers clean up the forest and trash bins were provided by a local restaurant that advertised its name on the bins. Guard posts, a toilet, and a parking lot were built and lights were provided. Unauthorized vehicles were not allowed in the forest and local people were not allowed to sell anything to tourists in the forest. Numbered admission tickets also were sold to each tourist for 500 rupiah (about US $ .25). The numbers on the admission tickets over a seven week period indicate there were 28 078 visitors or approximately 16 000 per month. The income generated from the tickets and food goes to the *desa adat* for temple improvement and conservation. As one committee member put it, « The money goes to God ».

Questionnaires

A preliminary analysis of the 136 questionnaires to the villagers shows that two-thirds of them said their income came from tourists, and that The Monkey Forest was an important part of their success ; 88 % of them visited the forest at least once a week ; 90 % said The Monkey Forest was important to Balinese culture ; 75 % said that the monkeys were not more aggressive now than five years ago ; 99 % said there were too many monkeys ; 78 % said that shops and hotels should contribute to conserve the forest and 78 % said that they should advertise The Monkey Forest to get more tourists. A more complete analysis is in preparation.

A preliminary analysis of the 50 questionnaires to tourists leaving The Monkey Forest shows that 80 % of them came to see the monkeys. 45 % of all tourists came from Europe, 32 % from Australia and New Zealand and 19 % came from the US and Canada. Two-thirds of the tourists were not afraid of the monkeys and 40 % fed them. Only 4 % said the monkeys bit them. 85 % of the tourists interviewed said they would recommend a visit to The Monkey Forest to other tourists. 40 % of the tourists had no suggestions on how to improve the forest. The most common suggestions were : clean up the trash and plastic ; have guides ; feed the monkeys less ; get rid of the motorcycles driving on the roads through the forest ; have more warning signs ; and have fewer tourists. A more complete analysis likewise is in preparation.

DISCUSSION

Over a million tourists are estimated to visit Bali (Picard, 1990) and many of them visit the district or regency of Gianyar, which is the cultural center of Bali. Gianyar is one of smallest in area of the eight districts in Bali (Eiseman, 1989), but it is the second most densely populated. It has been estimated that most of its 320 000 people rely on tourists for their income (Vickers, 1990). The cultural focus of this district is the village of Ubud where The Monkey Forest is located. The village is increasing in size as shown by the census figures, and there is evidence of many non-resident people, as well as newly arrived residents not recorded by the census, participating in the tourist economy (Wheatley, in

preparation). The area administering The Monkey Forest, Padangtegal, had the most recent addition of a new unit to the village of Ubud. Two-thirds of the respondents to our questionnaire said that their income came from tourists and that The Monkey Forest was important to their success. Over three-quarters of them said that The Monkey Forest should be advertised more to get more tourists and that shops and hotels should contribute to help conserve the forest. As of August, 1992, however, only one restaurant had advertised its name on trash bins in the forest. The people of the Padangtegal area explicitly point to the importance of tourism in increasing the per capita income of the people belonging to the *desa adat* or religious, customary unit that manages The Monkey Forest. The Executive Committee of The Monkey Forest at Padangtegal have associated the development and improvement of conservation directly to improving tourism.

The Monkey Forest is more than just a tourist attraction. It is an important and vital component of Balinese culture in Ubud. 90 % of the respondents to our questionnaire stated that The Monkey Forest was important to Balinese culture. Over 70 % said they visited The Monkey Forest at least 3-5 times per week. Many villagers went for evening strolls to the forest every day. The Monkey Forest is a holy area for Hindus. Temple ceremonies are conducted and graveyard ceremonies are held. The river is used for irrigation, bathing, and drinking.

The *tri hita karana* management style seeks the center or balance of forces where, for example, the monkey population is neither too high nor erosion too severe. The results of the questionnaire show that 99 % of the respondents believe that there are too many monkeys. The Executive Committee asked for advice on curbing the growth of the monkey population. They were especially interested in birth control but realized that monkeys will reject pills in food and that its reliability is not good. Trapping or catching the monkeys for relocation or for implanting birth control devices was flatly ruled out because the monkeys are sacred and cannot be interfered with. Norplant, for example, is successfully used on Barbary macaques at La Montagne des Singes in France (Merz, personal communication). The Executive Committee is also interested in knowing how to plant new trees or flowers without the monkeys destroying them.

The monkey population grew dramatically up to 1991 when 130 animals were estimated for The Monkey Forest. In 1992, 130 animals were again estimated for the total population. The age structure (see Table I), however, has changed. The percentage of immatures has plunged to 39 % and natality is 33 %. These percentages suggest a declining population for the future. Southwick & Siddiqi (1977) indicated that any proportion of immature macaques below 50 % of a population suggests a declining population. One of the biggest factors in the lack of population growth at The Monkey Forest is the excessive infant mortality. The proportion of infants in the population during the last few years has dropped to about 10 %. Infants die from starvation or wounds. Seven of the fourteen infant deaths occurred when neither the mother nor the female kidnapper lactated. The rates of inter-troop conflicts have increased. As previously mentioned, these rates increased more than doubling between 1986 and 1991. The extremely high population density, which is over 1 000 animals/km^2, is probably a contributing factor to both the increase in inter-troop aggression and the increasing infant mortality rates.

Food provisioning by tourists and local people has contributed to the increased monkey population up to an unsustainable level. A significant proportion of the macaques' food is from human sources. In 1986, the proportion of

dietary items from all human sources was 58 % (Wheatley, 1989). Approximately 23 % of the diet of troop 1 was peanuts provided by tourists who bought them from local vendors in The Monkey Forest. Another 19 % of the diet came from sweet potatoes provisioned by the local guards, and 9 % of the diet came from offerings by local people to the various gods and spirits of the forest and the dead. The rest of the diet from human sources was various fruits provided by tourists. In 1990, the diet of troop 1 was again estimated, although by a different method. A preliminary analysis of scan samples shows that approximately 56 % of their diet came from human sources (Wheatley, in preparation). 25 % came from peanuts ; 27 % from bananas and 4 % from offerings and foods provided by tourists. The feeding of bananas by tourists appears to have replaced the provisioning of sweet potatoes by local guards. Although the proportion of food from human sources appears to have stayed the same, the number of tourists entering the forest increased dramatically. In 1986, for example, the number of tourists visiting and giving donations was 800 per month (Wheatley, 1989). The number of tickets sold to tourists in 1992 was approximately 16 000 per month.

Tourists have affected the monkeys in other ways. Tourist presence, for example, is associated with statistically significant frequencies of both contact and non-contact aggression among the monkeys (Wheatley, 1991). Social grooming was statistically less significant when in the presence of tourists than when they were absent. The monkeys are not only aggressing each other more, but also the frequency of monkeys biting tourists appears to be increasing. Part of the cause of this increased aggression is that aggression is probably operantly conditioned (Wheatley, in preparation). Aggression is food rewarded by tourists. We focal-sampled tourists who fed the monkeys and a familiar pattern emerged. The tourists walked down the road with bananas and hungry monkeys ran at them, climbed on them and bit them until the tourist released the food. A number of interesting defenses to this aggression were employed by tourists. Some tourists used sticks to threaten the monkeys, others used lighters (the flame-thrower defense) and other tourists played keep-away with the food.

The management of The Monkey Forest is responding to the many challenges it faces in maintaining the proper balance of forces. They foresee the need to manage the population growth of the monkeys. The low percentages of immatures and natality, however, suggest that the population will decline anyway without birth control. Infant mortality is high. Our observations suggest that the rapidly increasing size and aggression of the all-male groups which hang out along the roads and on the periphery of two troops will need to be managed. The successful trapping and translocation of rhesus macaques in India (Malik & Johnson, 1991 ; Strum & Southwick, 1980) is not compatible with the management's desire not to interfere with the monkeys. We did notice, however, that some guards with the aid of a knife, appeared to be training animals not to be aggressive when offered food.

CONCLUSION

One of the most widely distributed monkeys in the world is the common long-tailed or crab-eating macaque of Southeast Asia. One explanation for its success is no doubt its ability to take advantage of opportunities provided by humans. The various monkey forests of Bali are examples of extreme commen-

salism where, for example, about 60 % of the diet of one troop comes from human sources (Wheatley, 1989). Although tourists provide most of this food, a significant portion comes from local people in the form of handouts, offerings to gods and spirits, and crop raiding of the fields around The Monkey Forest. At the other extreme, long-tailed macaques live in rainforest relatively undisturbed by humans. A close look at these forests, however, shows that the areas most frequented are along streams and rivers in precisely those areas that were slashed and burned for local gardens 20 to 30 years ago (Wheatley, 1980). The secondary forests that grow back in these areas contain pioneer tree species that are noteworthy for their continually available ripe fruits (Wheatley, 1976 ; 1980). The increasing production of riverine secondary forests by human swidden agriculture over thousands of years has probably facilitated this species' colonization of Southeast Asia (Wheatley, 1976).

The close association of monkeys and humans, however, has a risk. As human populations continue to grow and economic activities such as farming and logging continue to expand, the populations of non-human primates continue to decline. Monkeys can become a nuisance if they are not properly managed. The Botanical Gardens of Singapore contained several troops of long-tailed macaques 20 years ago when they were removed.

It may not be coincidental that many of the areas in Bali where these macaques live have steep gorges and cliffs. The cliffs of Uluwatu overlooking the Indian Ocean have monkeys. The riverine gorges at The Monkey Forest are also an area of safety for monkeys. We saw several wild troops in the riverine gorges at Bangli. In fact, one of those troops was fleeing downward from a dog and a farmer with a rifle and scope into the gorge when we first spotted it.

Monkeys are a vital component of Asian Hindu society. They pervade the arts and literature. The Hindu monkey god, *Hanuman,* is thousands of years old, further testimony to the ancient mutual association of monkeys and humans. A vital motivating force for conservation is the Balinese Hindu belief of harmony and balance, *tri hita karana.* The Monkey Forest Managerial Committee was developed to correct the various imbalances at The Monkey Forest, such as erosion, loss of flora and fauna, and the overpopulation of monkeys, and to respond to the economic potential of increasing tourism. Jobs are being created to raise the standard of living in the area surrounding The Monkey Forest. The income generated from tourists is going to the *desa adat* or religious/customary unit of Padangtegal. Temple improvements and conservation are, therefore, a tribute to God.

The importance of local conservation efforts in protecting flora and fauna is becoming more apparent (McNeely, 1992). Some of the most viable populations of rhesus monkeys, (*Macaca mulatta*), studied in the Aligarh district and at Tughlaqabad in central India, for example, were those populations that were protected by local people (Malik, 1988 ; Southwick and Siddiqi, 1983). Traditional religious or Hindu explanations for the protection of these two monkeys species, *M. mulatta* and *M. fascicularis* are, however, probably not sufficient to adequately protect them because both these species are seen as agricultural pests in their respective countries, India and Indonesia. Grove (1992), for example, emphasized that economic interests also play a major role in conservation. In this regard, the financial resource of tourism at The Monkey Forest is supporting the conservation goals as outlined by the Monkey Forest Managerial Committee.

The Monkey Forest Managerial Committee is a successful local unit that supports and develops conservation. Our experience over the last six years or so has shown us that scientists or primatologists must interact with local people if they are to have an impact on conservation. Primatologists will need to speak the local languages and talk to the local shopkeepers, village heads, farmers, and others about the economic and other opportunities that may exist.

While foreign scientists or other non-local people may recommend certain actions, it is important to emphasize that the most effective management decisions will be those with the support of the local people. Unwanted advice can be seen by local residents as outside interference. In 1986, for example, we offered to put up and pay for signs offering advice for tourists during their visit in The Monkey Forest, but at that time such an idea appeared to be an unwanted intrusion into management. Over the last few years we have held discussions on such problems as monkey aggression on tourists, the overpopulation of monkeys, and their raiding of crops. One solution we recommended was to trap and translocate the third ranked troop. That solution was flatly rejected because of its interference with the sacred monkey-god, Hanuman. The residents feared that an intrusion into the principle of harmony and balance, *tri hita karana* might lead to destructive occurrences as happened several years ago. At that time some of the monkeys were trapped and blood samples were taken. For months after the monkeys were released they were very aggressive towards people. Whatever solutions The Committee decides to implement will only come after consensus is reached among the local people. As to the effectiveness of this management style one only needs to look at the conditions of other monkey forests, such as nearby Sangeh (Wheatley, in preparation) or to the empty forests where monkeys used to roam. It is only through local efforts such as those at The Monkey Forest of Ubud that monkeys, tourists, primatologists, anthropologists, and local people can interact in a manner beneficial to all and conservation goals can be realized.

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RÉSUMÉ

Les macaques à longue queue (*Macaca fascicularis*) sont depuis longtemps commensaux de l'homme et profitent depuis des milliers d'années de l'association avec l'homme. Toutefois dans la dernière décennie, les populations de cette espèce déclinent avec l'accroissement continu des activités économiques en Asie du Sud-Est.

L'expansion de l'agriculture, l'exploitation forestière et d'autres formes de destruction de l'habitat conjuguées à la croissance de la population humaines sont

largement responsables du déclin mondial des populations de primates non-humains. Cet article décrit une exception notable caractérisée par l'accroissement de la population locale de macaques dans la Forêt des Singes de Ubud à Bali (Indonésie). Les communautés locales protègent la flore et la faune de la forêt de Ubud en favorisant les valeurs hindouistes traditionnelles et le tourisme. Un comité directorial de la Forêt des Singes s'est constitué au sein des structures religieuses et coutumières traditionnelles. Ce comité a proposé et mis en œuvre de nombreuses opérations de conservation dont le contrôle de l'érosion, la plantation d'arbres, et l'accroissement de la surface de forêt. Nous avons travaillé en contact étroit avec les communautés locales pendant 7 ans et nous insistons sur l'importance de cette action au sein des formes traditionnelles de gouvernement local. Nos premiers résultats scientifiques ont été présentés au comité et nous avons fourni notre avis sur les problèmes rencontrés, par exemple, entre touristes et singes. Les scientifiques peuvent ainsi jouer un rôle efficace de conservation en travaillant en accord avec les populations locales dans leur contexte culturel.

Mots-clés : Indonésie, conservation, tourisme, hindouisme, forêt des singes Bali, *Macaca fascicularis.*

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